

Moons of Mars - Activities (Ages 16-18)



Today we are going to investigate:

- The moons of Mars
- The surface features of the moons
- The moons' orbital characteristics
- The moons' density

Activities

1

Phobos and Deimos are the two natural satellites (or moons) of the planet Mars. They were both discovered in 1877. Start Night Sky and use Search for Phobos. This is the larger of the two moons. Tap on the  to view a 3D model of this moon and rotate it to inspect the shape of Phobos. Once you have done this, find Deimos and examine its 3D shape.

Question: Question: Which of these terms best describe the shapes of these moons?

Irregular Spheroidal Ellipsoidal Elongated

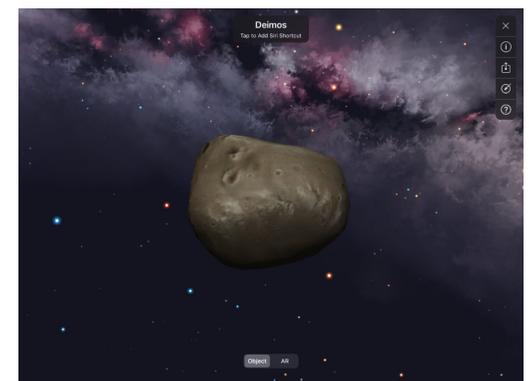
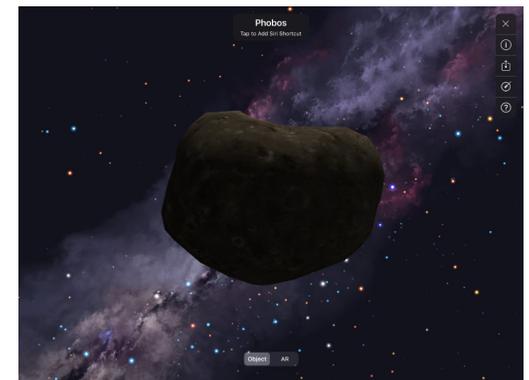
2

These moons are among the smallest known moons in the Solar System. The average radius of Phobos is 6.9 miles (11.1 km), while the average radius of Deimos is just 3.9 miles (6.2 km). Their surfaces are covered in thick layers of dark-colored dust.

Question: Looking at the 3D models, can you see any evidence for this dust? (Hint: look at the impact craters on their surfaces.)

3

As they are so small, both moons have very weak gravitational fields. At its surface, the gravitational acceleration on Phobos is only 1/1,000th the gravitational acceleration on Earth.



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Question: If a person stood on weighing scales on Earth and they read 75kg, then stood on the same scales on Phobos what would the scales read?

Can you use their low gravity to explain the unusual shapes of Phobos and Deimos?

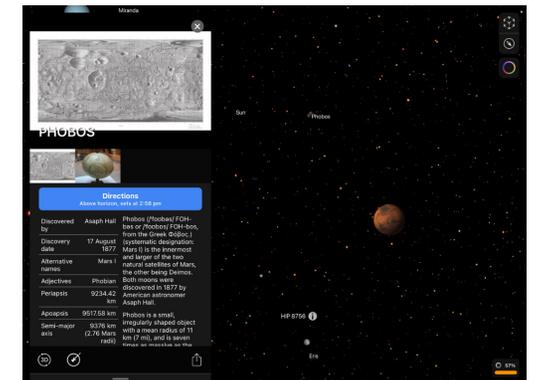
4 These two moons are also unusually close to Mars. You can find out details of each moon's orbit by tapping on  which brings up full Information tiles on the moons.

Question: Phobos and Deimos were discovered long after many other moons had been found around other planets. Which of their physical characteristics do you think made them difficult to find?

5 The average densities of both Phobos and Deimos are considerably less than the density of the dusty material on their surfaces. They are also much less dense than other rocky moons, planets and asteroids.

Question: Which of these options could explain the low densities of Phobos and Deimos? Explain why you think this.

- a) They are full of gas
- b) They are hollow
- c) They have a porous structure



What we have discovered:

- Phobos and Deimos are the two moons of Mars
- Both moons are small and irregularly-shaped
- Their surface gravitational accelerations are very low
- Both moons are of unusually low density